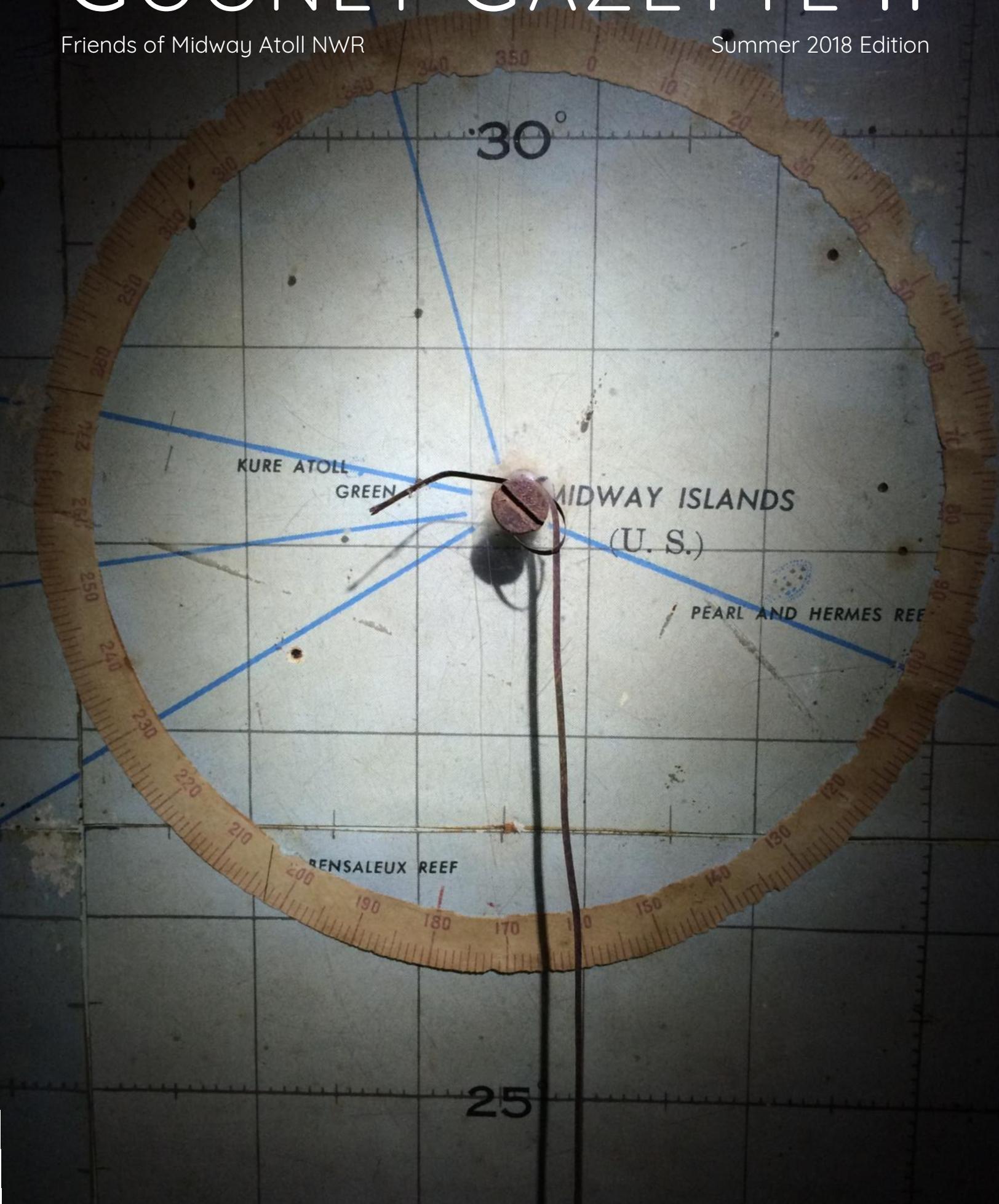


GOONEY GAZETTE II

Friends of Midway Atoll NWR

Summer 2018 Edition



GOONEY GAZETTE II

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Abandoned Midway

By Eric Baker

Venturing inside the remnants of the atoll's past, former Biology Volunteer Eric Baker provides a glimpse into these mysterious and alluring places through his black-and-white film photographs.

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Midway Seabird Protection Project

By U.S. Fish and Wildlife Service

Mice are attacking nesting albatross on Midway Atoll NWR—the largest albatross colony in the world and the most important and successful breeding ground for Black-footed Albatross and Laysan Albatross. USFWS is planning to eradicate these invasive house mice in the summer of 2019.

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Like a Duck to Water

Research by M. H. Reynolds, K. N. Courtot, and J. S. Hatfield

Laysan Ducks—one of the world's most endangered waterfowl species—were on the verge of complete extinction in the early 20th century. Now, more than 10 years after they were re-introduced on Midway Atoll NWR, we examine the ducks' past, present, and future.

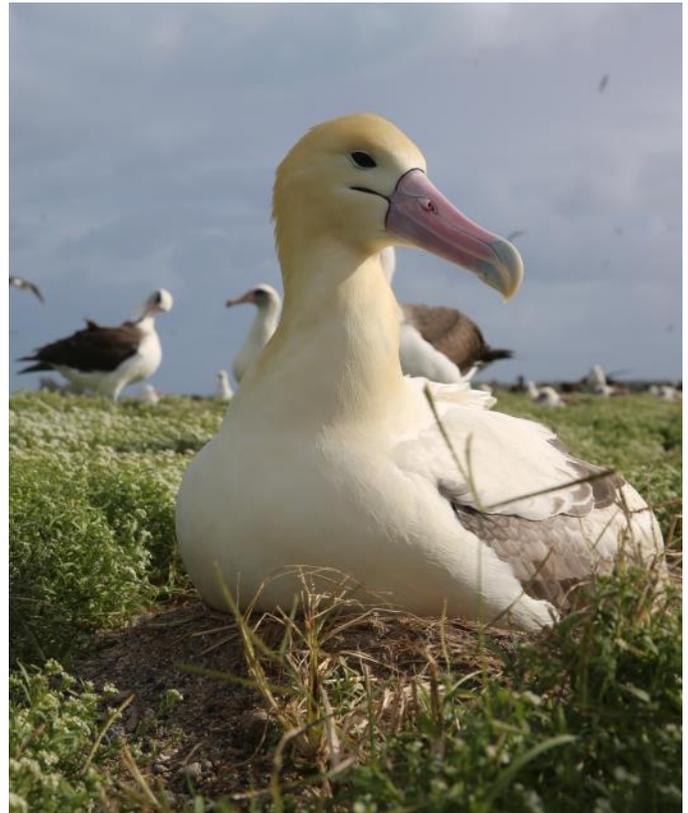
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Short-tailed Albatross at Midway Atoll NWR by USFWS



Friends of Midway Atoll NWR (FOMA) Battle of Midway National Memorial

Our Mission: "To support Midway Atoll National Wildlife Refuge / Battle of Midway National Memorial in its efforts to preserve, protect, and restore the biological diversity and historic resources of Midway Atoll, while providing opportunity for wildlife-dependent recreation, education, cultural experiences, and scientific research."

FRONT COVER: Inside the now-silent Navy Aviation Offices, a map for plotting air routes to and from Midway Atoll hangs unused in the dark recesses of the NAF Hanger. Guest columnist Eric Baker documents Midway's abandoned places through his haunting black-and-white images. Cover by Eric Baker.

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Friends of Midway Atoll National Wildlife Refuge plays a pivotal role in the conservation and restoration of Midway's natural and historic resources through financial and volunteer support, dynamic outreach and education, effective advocacy in the support of Refuge programs, assistance in the development of an inspirational visitor program, and productive collaboration with diverse partners.

VALUES

- Focus on highest priority actions
- Be a voice for our members
- Share science-based information
- Operate with integrity
- Be accountable with our actions and resources

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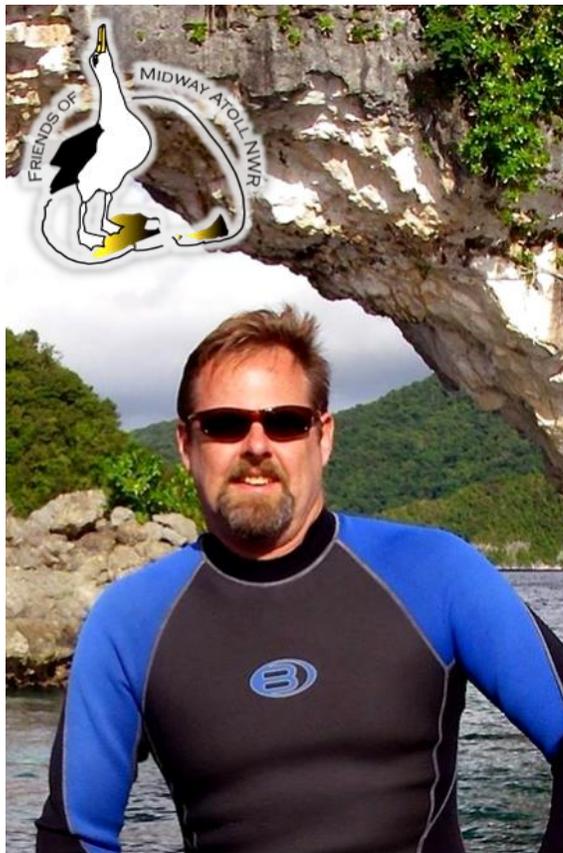
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Top right: Laysan Albatross parent and chick. Bottom right: Turtle Beach, Jon Plessner, Island Conservation.

FROM THE PRESIDENT

Dear Friends,

Once again, thank you for your continued support. We are always reminded of how critical the contributions from our members and friends can be to our ability to achieve the mission of Friends of Midway Atoll National Wildlife Refuge and the Battle of Midway National Memorial. With the continuation of no public visitation out on Midway Atoll NWR, one of the main sources of our funding (i.e., sales from our on-island gift store) are not as robust as when there is an active visitation program. Thus, we are left to find creative ways to generate much needed revenue. This year, we want to extend a warm *mahalo nui* to the students in the Oak Park Unified School District, and specifically their Environmental Education and Awareness Committee. This year, they selected FOMA as the recipient of their annual coin drive, sponsored throughout their week of Earth Day festivities by schools in the district. Students wanted to focus their support on efforts related to reducing plastic pollution. Together, teachers and the students worked hard and managed to raise over \$4,500 for FOMA. Kudos to those kiddos and their teachers—we promise to put those funds to good use in the coming months!

We also would like to thank Kim Steutermann Rogers who has managed to raise over \$1,000 (and counting!), by donating part of the purchase price of each "Wisdom" bracelet (an aluminum band hand-stamped with Wisdom's AUX band ID: Z333) to FOMA. If you do not already have yours, please visit Kim's website at <https://www.albatographer.com/wearable-art/wisdom-band> and get yourself one!

I hope you enjoy this new edition of the *Gooney Gazette II* and thanks to all of you who help make it happen!

Aloha and mahalo a nui loa,

Wayne Sentman, FOMA President (Midway Atoll Resident 1998–2002)

Abandoned Midway

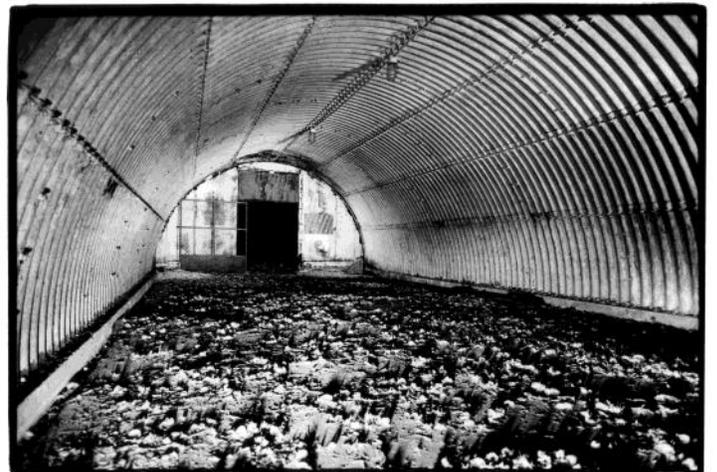
Illustrations and text by Eric Baker, 2016/2017 Midway Atoll NWR Biology Program Volunteer



A Laysan Albatross and its chick nest beneath the crumbling overhang of the abandoned WWII Command Post.

Starting with the construction of the first Cable House in 1903, Midway Atoll has seen its share of permanent structures come and go. In 1935, Pan American Airways added their seaplane facilities and the Gooneyville Lodge to the atoll. The frenzied build-up to WWII started in 1940, and the rapid expansion to fortify and enlarge Midway continued throughout the war, culminating with construction of the expansive Cold War facilities on Midway Atoll.

Today, only one of the four Cable Houses remains. Its majestic porches are now shored-up by wooden two-by-six supports, and despite recent efforts, the iconic building cannot be restored and will eventually yield to the elements. The concrete walls and floors of the Navy's WWII Command Post, several feet-thick in places, have been grotesquely twisted and buckled by the forces of nature.



Bones and feathers of seabirds that became trapped inside an Armco Hut ammunition magazine litter its floor.

Charlie Barracks, constructed in 1957, is the only barracks building still habitable (“habitable” being a relative term, depending on who you talk to) but its days are numbered. The flap of an albatross wing could be all it takes to collapse the seriously deteriorating structure atop Radar Hill. The Midway House and Officers Quarters, designed by industrial architect Albert Kahn, have fared better, largely because of the termite-resistant cedar framing used in their construction and ongoing renovation efforts. Even the Clipper House and Captain Brooks buildings, purposely built for tourism by the Midway Phoenix Corporation, are showing their age.

With the Navy’s departure and environmental clean-up in the 1990s, more than 100 structures were demolished. The Department of the Interior requested that some buildings remain for their use, not knowing that some twenty years down the road those buildings would become more of a liability than an asset.

Their method of construction would be their undoing.

Rather than using fresh water and sand to make concrete, salt water, and coral sand were used instead. The use of salt water and coral sand caused the internal steel reinforcing bars to corrode, expanding and fracturing the concrete from within.

To say some of these abandoned buildings are death-traps would be an understatement. Concrete sloughs off ceilings overhead. Entire sections of walls can collapse with the slightest disturbance. Because of this, abandoned buildings are strictly off-limits. Permission for entry is required for obvious safety reasons; a hard hat and respirator are required gear. Lead-based paint and asbestos create a potentially deadly airborne hazard inside many of these buildings. A chunk of concrete landing on your head would—well—pretty much ruin your day, if not end it right then and there. But poking about these abandoned buildings has a dangerous and voyeuristic allure.

There is a haunting, somewhat melancholy, stillness inside these buildings. The offices of the defunct Midway Phoenix



Peeling layers of paint and crumbling concrete now adorn the walls of the recreation room inside the Delta Barracks.

Corporation look like they were vacated in haste; thousands of blank credit card forms litter the floor like so many leaves fallen from a tree. Abandoned barracks remain furnished, as if awaiting their residents' return. Photos of family and friends remain taped to the walls. Clothes are arranged on hangers. Magazines and personal belongings still lay about these now-uninhabited spaces. All these accoutrements attest to a human presence that once flourished inside these walls.

My connection to Midway's historic past was personal. My father was stationed here during WWII (see Winter 2016 *Gooney Gazette II*). As a touchstone to our shared past, I carried my father's 1945 RCA Radio Tube Reference Datebook, the same one he carried with him when he ran the Armed Forces Radio Station KMTH on Midway. Inside the notebook, on December 29, 1945, he wrote: "Arrived Midway 21:30." At the appointed hour, exactly seventy-one years later, I ventured into the night, hoping to experience some connection. Nothing happened.



Three lanes inside Midway Bowl are still operational, and scores can be tallied on the abundant supply of 1960s score cards. Frozen in time, one can almost imagine the Cleaver Family walking into Midway Bowl to bowl a few frames.



Alongside a bank of transformer panels inside the Transmitter Building, a Laysan Albatross attends to its chick. This chick later became entangled in the plastic debris in its nest and died.



On the apron outside the Seaplane Hanger, the largest of the remaining WWII buildings, a Laysan Albatross arranges pebbles to build its nest.



Many barrack rooms still remain fully furnished. Some were decorated with murals or other personal touches to make them feel like "home" to their former residents.

Feeling a bit embarrassed, I nevertheless came away with the realization that he too would have experienced the same cool night air and starry skies that I had. Walking home in the darkness I was struck in the head by a flying petrel—a whack on the side of the head, as it were, for

imagining that I would have experienced some ethereal connection. Another person might have interpreted this event as cosmic irony, but on Midway being struck in the head by an errant petrel is nothing special.

The wood-framed barracks that my father would have recognized, the KMTH studios, and the majority of WWII-era buildings are gone. The abandoned structures that remain date mostly from the Cold War era.

These too have a mysterious aura about them. Inside the NAF Hanger, the U.S. Navy offices look like they were departed in haste. File cabinets remain filled with files, technical manuals line the shelves, blueprints lay about, stacks of electronics equipment and repair parts fill entire rooms. In the “Map Room,” a world map peels away from the wall, slowly fading away like Midway’s military role in the Pacific. In a room used by Thai workers as a Buddhist shrine, incense is arranged in ceramic mugs and images of the Buddha adorn the walls. Bunks in the enlisted quarters are now vacant. Desks in the teaching room are empty.



Navy personnel left their comments on the wall-size world map inside the "Map Room" of the NAF Hanger.



Time and tide slowly reclaim the WWII pillbox on South Beach.



The ghost in the machine shop. Idle machines seemingly await their operators to materialize and resume work.

The tranquility is broken only by the wind whistling down now-silent corridors, the squeak of rusty hinges, or the occasional “flop-flop” of webbed feet on concrete floors.

Abandoned buildings are a serious hazard to seabirds. An open door or collapsed ceiling is an entry point for a wandering albatross, opening up a maze of rooms from which it might never escape.

During my six months on Midway Atoll National Wildlife Refuge as a biology program volunteer (see Summer 2017 *Gooney Gazette II*) I extricated at least 50 seabirds from a variety of entrapments. That number might sound small, but that’s 50 seabirds which might have been removed from the breeding population. Consider Wisdom, the world’s longest-lived Laysan albatross, who at 67 years old has parented up to 36 chicks. The loss of a single individual can have long term consequences to the entire population. To that end, lead paint abatement has been an ongoing priority for several years. Lead-based paint flaking off building’s exteriors can be ingested by chicks, resulting in the fatal “drooping-wing syndrome.” The exteriors of many derelict buildings have been sprayed with a paint that encapsulates

and seals the lead-based paint in-situ. As part of the habitat restoration efforts on Midway Atoll NWR, a site is cleared of debris and any lead toxins in the soil after a building has been demolished followed by one to three feet of clean sand to fill the gaping footprint. The plot is then planted with a mixture of native plant species in an effort to return it to its once-natural state.



“Kills”—albatross-shaped stencils indicating birds killed by aircraft strikes—are tallied on the NAF Hanger walls.

As a biology volunteer, habitat restoration was a primary duty. Digging holes and pulling weeds isn't particularly glamorous; it's dirty, hard work. My presence was not one of a tourist who was just there to take pretty pictures of birds or check some place off a bucket list; I was here to make a positive contribution to the world in which I live.

Midway Atoll is unique in that it's both a National Wildlife Refuge and a National Memorial, commemorating the Battle of Midway. North of the atoll, where the historic naval battle took place, the Japanese carriers *Akagi*, *Kaga*, *Soryu* and *Hiryu*, along with the American carrier *USS Yorktown*, now rest silently on the ocean floor. Hidden from sight thousands of feet below the waves, they serve as mute reminders to the battle that turned the tide of the war in the Pacific. Only the wreck of the *USS Yorktown* and a portion of the *Kaga* have ever been located.

On Sand Island, the remaining WWII buildings and four memorials serve as reminders to the valor and sacrifice of American servicemen during the battle. These include the International Midway Memorial Foundation monument on

the Parade Grounds; the American Battle Commission memorial overlooking the inner harbor; the George H. Cannon Marker outside the Power House; and the Navy Memorial by the Midway Mall. Often overlooked is the Japanese Peace Mark, obscured behind Naupaka bushes near the Clipper House. The simple black granite stone is the only memorial to commemorate both the Japanese and the American lives lost during the Battle of Midway, and the only one to convey the importance of peace and wildlife.

It is perhaps peace and wildlife that should be the future focus of Midway Atoll. Time and tide will eventually return these abandoned structures to the coral sands from which they were constructed—no maintenance or restoration will prevent their eventual demise. The vibrancy of human life that once filled these abandoned buildings now fills the spaces outside them, as albatross dance and perform their own vibrant rituals, just as they've done on this remote coral atoll for countless millennia. Midway's past will live on in its monuments and history books, but the future preservation of Midway Atoll should live on as a sanctuary for the preservation of its native wildlife. ☒



Laysan Albatross exchange parenting duty outside the last remaining Cable House.



MIDWAY SEABIRD PROTECTION PROJECT

THE PLAN TO REMOVE INVASIVE HOUSE MICE

By U.S. Fish and Wildlife Service

Mice are attacking nesting albatross on Midway Atoll NWR—the largest albatross colony in the world and the most important and successful breeding ground for Black-footed Albatross and Laysan Albatross. In just a few years, mice attacks have increased from just a few incidents to hundreds of wide-spread attacks on albatross that result in injury, nest abandonment and death. In order to protect the colony, the U.S. Fish and Wildlife Service (USFWS) is proposing to remove the invasive house mouse from Midway Atoll NWR. A draft environmental assessment for the project was available for public comment from March 21st to April 20th. Currently, USFWS is reviewing comments and responding to all questions submitted by the public. Moreover, USFWS is also drafting a Laysan Duck mitigation plan to supplement the draft environmental assessment.

Within Papahānaumokuākea Marine National Monument (Monument), Midway Atoll National Wildlife

Refuge and Battle of Midway National Memorial supports over three million birds from 30 different species. Nearly 40% of all Black-footed Albatross and 70% of all Laysan Albatross in the world rely on the approximately 1,500 acres of islands that comprise the remote atoll. Seabirds face a myriad of threats—from fishery interactions and marine debris to invasive species and shrinking habitat. Safe places like Midway Atoll NWR, where seabirds can rest and raise their young, are critical for their ability to survive into the future.

Non-native, invasive house mice and black rats became established on Midway Atoll's Sand Island more than 75 years ago, before it was a Refuge and Memorial. House mice persisted after black rats were eradicated in 1996 and are now the sole rodent and non-native mammal present in the Monument. Biologists do not yet know what triggered the mice to begin preying on the albatross.

Mice are omnivores—meaning that they will eat any source of food they can find in their quest to survive—and although they had been present on Midway Atoll NWR for decades, there had never been a documented case of predation on adult albatross by mice before the 2015 hatching season.

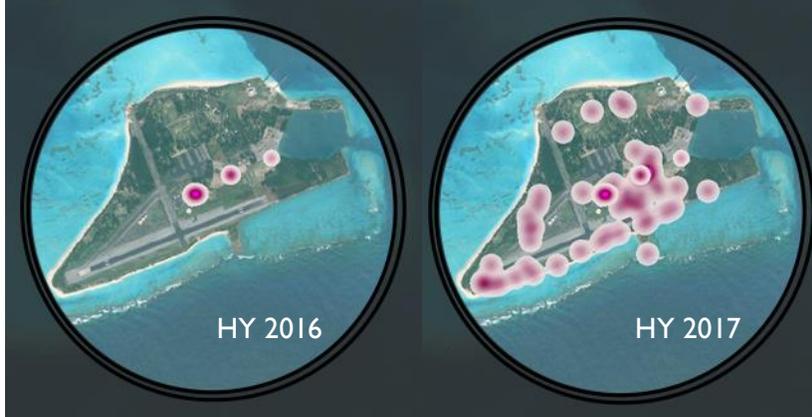
The majority of seabird extinctions around the world have been caused by invasive mammals, in particular non-native rodents. For most of the atoll's history, there were no rodents on Midway. Pacific seabirds like the albatross evolved without any fear or defense mechanisms against mammalian predators like mice, rats, cats, dogs, or humans.

Part of the danger to the colony is that mice reproduce very quickly compared to albatrosses, which have a very slow reproductive cycle. Albatross pairs only have one egg every one to two years, and both parents invest a lot of energy into hatching and raising that chick. The incredible amount of time and work necessary for albatrosses to survive to adulthood, find a mate, and become a successful parent means that each adult bird is incredibly important to the overall survival of the colony.

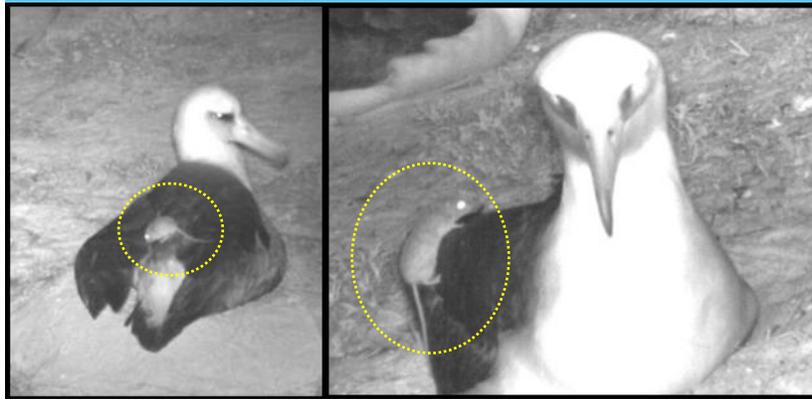
Their lack of defense mechanisms and complete dedication to their eggs has left albatrosses vulnerable to predation. Their slow reproductive cycle means that losses to the colony from being preyed on by mice will continue to impact the population for decades to come.

“This was something we had never expected to occur. Mice preying on adult albatrosses simply hasn't been recorded here,” said Matt Brown, Superintendent for the U.S. Fish and Wildlife Service in Papahānaumokuākea Marine National Monument.

“Regardless of what caused them to start this behavior, it has the potential to cause an incredible amount of damage to this colony. And it's a problem that we have to address.”



The map above illustrates the severity (darker colors) and spread of mouse attacks on Sand Island of Midway Atoll NWR, starting in Hatch Year 2016 (Fall 2015-Summer 2016) to Hatch Year 2017 (Fall 2016 to Summer 2017). Within two years, the attacks had spread across the entire island. For Hatch Year 2018 (Fall 2017 to Summer 2018), only two attacks of mice on albatross have been documented, thanks to proactive bait (cholecalciferol) deployment prior to the arrival of albatross in the Fall of 2017. Both albatross affected by mice attacks in Hatch Year 2018 have recovered. Source: USFWS.



Stills from camera footage documenting house mouse attacks on incubating albatross. Mice were attacking adult albatross as they sat on their nests—essentially eating the birds alive. Nesting albatross are particularly vulnerable to attacks by mice because they refuse to abandon their egg. Source: USFWS.



“This was something we had never expected to occur. Mice preying on adult albatrosses simply hasn't been recorded here.”



Midway Atoll NWR is one of the most remote places in America. Culturally significant for Native Hawaiians, it has also been a place of strategic importance for communications, commercial airlines, and the military—and it has always been a home for wildlife. Today, more than ever, fish and wildlife rely on the marine and terrestrial habitat at Midway, safeguarded and maintained by the U.S. Fish and Wildlife Service as the Midway Atoll National Wildlife Refuge and Battle of Midway National Memorial and Papahānaumokuākea Marine National Monument. Source: USFWS.



The proposed action to remove mice from Midway Atoll NWR and the alternatives considered are evaluated in a draft environmental assessment. To date, there have been more than 500 successful projects to remove invasive rodents from islands, and the proposed project on Midway Atoll NWR models similar, successful projects elsewhere.

USFWS is proposing to eradicate all mice from Midway Atoll NWR using the rodenticide Brodifacoum 25D Conservation, a pelleted rodenticide bait intended for conservation purposes for the control or eradication of invasive rodents on islands or vessels.

The rodenticide would be applied across the island in small baited pellets that would be distributed using both aerial and hand applications. The applications would be timed to ensure that all mice have sufficient access to the bait, but other non-target species' exposure is limited. The aerial applications would be carried out using helicopters and specially designed distribution buckets.

USFWS has coordinated with the Monument co-managers and worked with Island Conservation, American Bird Conservancy, National Fish and Wildlife Foundation, National Oceanic and Atmospheric Administration and other members of the conservation community in the synthesis and development of the science that contributed to the development of the draft environmental assessment.

The USFWS will post responses to public comments about the draft EA soon, so be sure to check on Midway Atoll NWR's website (https://www.fws.gov/refuge/midway_atoll/). Moreover, USFWS will release specific mitigation plans for Laysan Ducks (*Anas laysanensis*) and Bristle-thighed Curlews (*Numenius tahitiensis*), as these are both federally-listed and protected species and special precautions need to be implemented to minimize their exposure to the rodenticide bait.

For additional information and answers to common questions about the draft EA, please visit <https://tinyurl.com/y8jsau7t>. ☒

Like a Duck to Water

The Past, Present, and Future of the Laysan Duck

Featured research by Michelle H. Reynolds, Karen N. Courtot, and Jeff S. Hatfield

Summarized by Wieteke Holthuijzen, FOMA Board Member

Photo by Megan Dalton

From afar, Laysan Ducks may not seem that special. They are relatively small ducks, about the size of a Blue-winged Teal, and mottled brown in color, with a noticeable white-eye ring. But up close, these ducks are surprisingly beautiful, a humble feature that only adds to their quirky, curious attitude. Their mottled brown color—a frenzy of alternating dark brown and tan chevron patterning—helps these ducks hide well in vegetation. When they do come out to explore (and they are indeed curious), they are a spectacle to watch. Large groups of them can be heard from afar, their *raehb-raehb-raehb* calls rising above the whistles, moos, and bill claps of the albatross colony on Midway Atoll NWR. Gathered around seeps (wetlands), the ducks paddle around, forage for invertebrates, or nap on the banks, and utter soft calls to one another. Sometimes, seemingly large discussions break out among the ducks in a crescendo of calls when an especially intriguing (or worrying) phenomenon is sighted. These little ducks have a lot of attitude. And perhaps it is this trait—along with the help and

dedication of numerous scientists, researchers, refuge staff, and volunteers—that has been crucial to this species' survival.

Once found throughout the Hawaiian Islands prior to Polynesian contact, the Laysan Duck is now arguably one of the world's most endangered species due to its restricted range and small population size. With the initial arrival of humans and a slew of non-native species (including pigs, dogs, and rats to name a few), the Laysan Duck was unfortunately wiped out from the Main Hawaiian Islands as recently as 800-1,000 years ago. Despite all these new biological invasions as well as later human-related activities (deforestation, overgrazing, and soil erosion), the Laysan Duck fortunately found refugia further up in the Northwestern Hawaiian Islands, surviving at Laysan Island and Lisianski Island.

Even so, the Laysan Duck endured multiple close brushes with extinction. Although population estimates of the Laysan Duck on Laysan Island were unknown before the 1800s, it's estimated that 500-700 of these little ducks populated the 1,016-acre island.

The Laysan Duck's other refugia, Lisianski Island, was a short-lived safe haven. Ducks persisted on Lisianski Island from 1828-1859 until the reduction of habitat by introduced rodents and perhaps over-harvest by ship-wrecked mariners likely caused this species' extirpation on the tiny island. A similar, devastating fate nearly occurred on Laysan Island. From 1891 onwards, Laysan Ducks and other endemic species on Laysan Island would be subjected to an array of threats and changing conditions, ranging from extensive guano mining operations to plume hunting to native habitat destruction by introduced European Hares. Due to the loss of habitat by hares on Laysan Island, Laysan Ducks almost went extinct; the population plummeted to only 7-20 individuals between 1911-1936. One account even estimates that the Laysan Duck population dropped to just one gravid female in 1930. Just one.

Lucky Ducks

The situation certainly seemed dire. Moreover, it's rare to hear of recovery when a species is limited to only a handful of individuals, especially when largely unaided by human help. Thankfully, conservation efforts were put in place, and by 1923 European Hares were removed from Laysan Island. As needed habitat began to develop, ducks showed signs of recovery and population growth, eventually reaching a peak of 688-746 individuals in 1961. Yet, this entire species' population was restricted to only one (tiny) island. Dr. Michelle Reynolds, who wrote her dissertation on the foraging ecology, population dynamics, and habitat use of Laysan Ducks, and various ecologists had long expressed concerns that all the Laysan Ducks' eggs were in one basket—i.e., Laysan Island. So, as part of a large collaborative effort, 42 ducks were translocated 400 miles northwest from Laysan Island to Midway Atoll NWR in 2004-2005. Other

translocations had occurred in the past (unsuccessfully), but the 2004-2005 experimental reintroductions were incredibly successful. 100% of the translocated ducks survived; 100% of the ducks survived upon arrival at Midway Atoll NWR; 100% of the ducks survived 2 months post-release. And, to this day, there are still a handful of ducks dabbling around Midway Atoll NWR that were part of the original “founding” population. Within the first year of the translocation to Midway Atoll NWR, the ducks bred very successfully, with the founder population increasing to a total of 661 birds (95% CI 608-714) by 2010.

However, the work to preserve this species didn't stop after the translocation. Intensive post-release monitoring through radio-tracking (partially supported by FOMA) was critical during the initial breeding seasons to provide precise estimates of survival and reproduction. After all, the idea behind the translocation was to expand the species' range and population size—so keeping track of ducks was key. As a next step to understanding the outcome of a reintroduction attempt and to inform future management, Reynolds and other biologists marked a proportion of the Midway Atoll NWR duck population (with plastic leg bands) to identify and monitor individuals for estimating survival and abundance through capture-recapture or resight analyses. From 2004 onwards, biologists and volunteers logged thousands of resight records, keeping track of when and where they spotted individual ducks to determine population trends. However, Laysan Duck conservation efforts faced multiple challenges on Midway Atoll NWR. Between 2010 and 2012, a population decline of 38% was observed after the 2011 Tōhoku Japan earthquake-generated tsunami inundated 41% of the atoll. Moreover, multiple avian Botulism type C (*Clostridium botulinum*) outbreaks impacted the duck



As part of a large collaborative effort, 42 ducks were translocated 400 miles northwest from Laysan Island to Midway Atoll NWR in 2004-2005.

To this day, there are still a handful of ducks dabbling around Midway Atoll NWR that were part of the original “founding” population.

population as well; during 2015, an especially severe botulism outbreak decreased the duck population by 37%. Multiple threats make it prudent to manage the ducks' habitat aggressively and be prepared to step in quickly in the event of a fuel spill or another contaminant, natural disaster, or epizootic outbreak.

Reynolds and other biologists recognized the need to implement different monitoring methods to keep track of the population that allowed for more time and effort to be spent on conservation and restoration work—not just for the Laysan Ducks, but for the +2 million birds that inhabit Midway Atoll NWR. In the newest research by Dr. Michelle Reynolds, Karen Courtot, and Jeff Hatfield, they introduce a novel monitoring approach that shifts from labor-intensive radio tracking and resights to a simple survey. This new survey method does not involve the capture or banding of any birds and only requires one or two surveys per month for estimating population abundance or detecting population declines. Moreover, their publication also estimates the current population of ducks on the Refuge using this new approach: about 375 (95% CI 314-435), or approximately 50% of the global population (in 2015).

The story of the Laysan Duck's recovery is one of hope. From even the brink of extinction (or rather, multiple slips to the edge of extinction), ducks have recovered time and again. Yet, work remains to be done and key habitat management is crucial to the survival of this species. Moreover, with the pending mouse eradication on Midway Atoll NWR, uncertainty remains regarding the impact of this conservation intervention on the Laysan Ducks. The Draft Environmental Assessment for the mouse eradication acknowledges that the ducks are quite vulnerable to the proposed rodenticide: "exposure is presumed to be substantial, and without mitigation, a large number of individual ducks present on the island during the eradication would very likely succumb to the toxic effects of the rodenticide." The U.S. Fish and Wildlife Service is currently preparing mitigation plans to reduce the duck's exposure to rodenticide; we hope that these efforts and the mouse eradication will further bolster this vulnerable duck population and help support ongoing recovery efforts. ☒

*To read the full publication featured in this article, please refer to: Reynolds, M.H., Courtot, K.N., and J.S. Hatfield. 2017. How many Laysan Teal *Anas laysanensis* are on Midway Atoll? Methods for monitoring abundance after reintroduction. *Wildfowl* 67:60-71. <https://wildfowl.wwt.org.uk/index.php/wildfowl/article/viewFile/2664/1781>.*





Diorama by Norman Bel Geddes, depicting the attack by American “Dauntless” dive bombers on the Japanese aircraft carriers Soryu, Akagi, and Kaga in the morning of June 4th, 1942. Source: Naval History and Heritage Command.

Book Review

By Barry Christenson, FOMA Board Member

Today’s Midway Atoll is overlain by three administrative jurisdictions: A National Wildlife Refuge; the Battle of Midway National Memorial; and the Papahānaumokuākea Marine National Monument. Each of these units was established for a specific reason making this small spot in the North Pacific important both nationally and globally. The International Midway Memorial Foundation (IMMF) Founder Dr. James D’Angelo has written a new book which delves deeply into the Battle of Midway and points out very clearly why this three-day battle in 1942 was critically important to the Allied victory in World War II and why—as a consequence—Congress established the Battle of Midway National Memorial in 2000.

There have been many books, both American and Japanese, written about the Battle of Midway (BOM). This reviewer has read over a dozen books about the Battle and it is clear that it still captures the attention of historians and WWII scholars today. Dr. D’Angelo has written a welcome addition to this library concerning events on Midway during the period of June 4-6, 1942.

As nicely pointed out by William S. Dudley in the Foreword, Dr. D’Angelo “is always thinking about the ‘what ifs’ of the

Victory at Midway: The Battle That Changed the Course of World War II by Dr. James M. D’Angelo

past.” What might have happened if the Japanese had followed a different path in their battle plan? What if Admiral Naguma had decided to launch all available Japanese planes at the time the USS Yorktown was discovered?

This “counterfactual” approach makes this book different from all the others that I’ve read and makes it notable for that reason alone. But the author also does a very thorough job outlining and analyzing events that lead to the BOM such as the Doolittle Raid and the Battle of Coral Sea.

One very interesting point that Dr. D’Angelo returns to several times in the book is a discussion on aircraft carrier battle strategy, specifically the need to have flexibility of movement. He maintains that the dual missions of defeating the American carrier fleet and occupying Midway caused the Japanese fleet to lose their flexibility of movement which made it easier for our fleet to find and defeat them. This is an interesting point which I have not found in other books about the battle. Readers of Dr. D’Angelo’s book will find an extensive discussion on this and other tactical aspects of naval warfare that together add an interesting aspect to his discussion of the BOM.

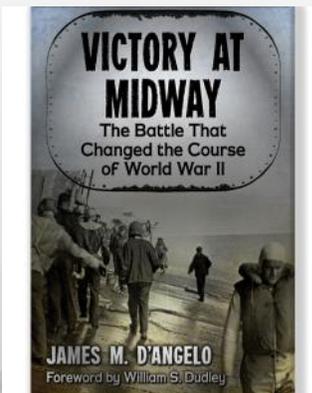
The details of the battle are set in history and do not change with authors. But *interpretations* of those events are what differentiate the many books about the Battle of Midway and Dr. D'Angelo has taken that approach farther than most authors. As highlighted by the title, Dr. D'Angelo makes the case that Midway was *the* pivotal battle that changed the course of World War II. He addresses that argument throughout the book at various points but summarizes it most completely in his last chapter, "The Significance of the Battle." A reader could glean most of his intent by reading that chapter alone but would miss many other unique discussions by doing so. His main point is that the victory at Midway allowed the Allies to maintain their "Europe First" policy despite public opinion that viewed the Japanese as the main threat to America. Maintenance of the European focus led to victories in North Africa and led to the D-Day Invasion, all of which would have been delayed if the US had been forced to divert Atlantic resources to the Pacific to fight Japan. Additionally, Japan's loss at Midway altered how their war plans progressed from that point forward. Dr. D'Angelo discusses how the Russian/German front battles could have significantly changed if Japan had invaded Russia, forcing them to maintain troops and equipment in Siberia instead of moving them west as needed to fight the Nazis. The loss at Midway changed Japan from an aggressive, conquering nation to one fighting to maintain the status quo—and that change was pivotal in the outcome of WWII.

As a medical doctor, the author has included lengthy discussions about two medical issues that are normally not addressed by historians: Admiral Halsey's rash that prevented him from leading a task force at Midway, and Lieutenant

Best's flying with active tuberculosis. They are two of the many differing approaches taken by this author and which make this book unique.

Spoiler alert: the Battle ends the same in this book as in all the others. However, readers will gain a new understanding into why the Battle of Midway is still important 76 years after the Japanese carriers that destroyed Pearl Harbor went to the bottom of the Pacific in June 1942.

As I finish this review it is now June 4th, the 76th Anniversary of the Battle of Midway. Most Americans are not aware of this anniversary, but that does not diminish the importance of the BOM or the sacrifice made by the 356 Americans who lost their lives during the battle. As our World War II veterans pass away, it is incumbent on the rest of us to keep their devotion and sacrifice from passing into forgotten history. The veterans of the Battle of Midway, and all the servicemen and women of WWII, shaped the world in which we live today. Dr. D'Angelo's new book provides a new look at this important battle and provides convincing arguments that our lives today have been influenced by the events at Midway during June 1942 far more than most of us realize. ☒



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Torpedo Squadron Six (VT-6) TBD-1 aircraft are prepared for launching on USS Enterprise (CV-6) at about 0730-0740 hrs, 4 June 1942. Official U.S. Navy Photograph, now in the collections of the National Archives



KOA'E 'ULA

With a personality as bright and fiery as its tail streamers, the Red-tailed Tropicbird is a force to be reckoned with.

The Red-tailed Tropicbird (*Phaethon rubricauda*) is a strikingly beautiful seabird that is widely distributed throughout the Indian and Pacific oceans. It is a bird of many contrasts.

Its primary plumage is white, often with a tinge of pink. Its large, heavy beak and its two central tail feathers are bright red. A conspicuous black stripe adorns its head. In its immature stage, it is covered with black bars and spots.

Red-tailed tropicbirds nest in a shallow scrape in the sand, typically underneath the overhanging branches of shrubby vegetation or at the base of a tree. Adult female tropicbirds lay a single egg. Both parents share in the incubation and brooding of their down-covered chick.

They range widely in search of fish and squid. Parent birds regurgitate their catch into the gullet of their chick.

Tropicbirds are best known for their conspicuous aerial courtship displays. Bonded pairs and birds in search of a mate will typically gather in flight above their nesting areas. They circle, climb, dive, and fly backwards. Their aerobatics are legendary.

As striking as they are in the air, Red-tailed Tropicbirds are notoriously clumsy and awkward on the ground. Their legs are placed unusually far back on the body, forcing them to bounce on their breast as they move forward.

When approached too closely—by people or other birds—adult tropicbirds and chicks will mount a strong defense, punctuated with loud, guttural squawks. They will call during their aerial displays as well. It's not hard to understand why tropicbirds have been referred to as Bosun birds. The petty officer on a merchant ship and the warrant officer on a warship are referred to as the Boatswain. They bark orders to the deck maintenance crew they supervise. The tropicbirds at Midway were intimidating enough to prevent me from planting vegetables in nearly half of my garden.

The Midway population of Red-tailed Tropicbirds is larger than at other islands in the Hawaiian archipelago, but it faces similar conservation challenges. Eliminating rodents and managing invasive vegetation are critically important objectives. ☒





Mother Once More!

Meet Wisdom's New Chick

By U.S. Fish and Wildlife Service

Photo by USFWS

At 67, Wisdom, the world's oldest known breeding bird in the wild, is a mother once more! On February 6th, 2018, approximately two months after Wisdom began incubating her egg, Wisdom and her mate Akeakamai welcomed their newest chick to Midway Atoll NWR.

Midway Atoll National Wildlife Refuge and Battle of Midway National Memorial within Papahānaumokuākea Marine National Monument is a special place for over three million seabirds. They return to Midway Atoll each year to rest, mate, lay eggs, and raise their chicks.

"Laysan Albatross and other seabirds depend on the habitat protected by Midway Atoll and other remote Pacific National Wildlife Refuges," said Bob Peyton, U.S. Fish and Wildlife Service Refuge Manager for Midway Atoll Refuge and Memorial.

Biologists for the U.S. Fish and Wildlife Service are working to restore the habitat seabirds need at Midway Atoll NWR and throughout the Pacific and remove threats like invasive predators—because protecting the

future for seabirds mean protecting the places they call home.

Albatrosses and other seabirds return to the same nesting site each year. Wisdom has been using the same nesting site on Midway Atoll NWR since at least 1956, when she was first banded. Albatross lay a single egg and incubate it for a little over two months. After the chick hatches, it will still be another five months before it will leave the nest. In that time, Wisdom and her mate Akeakamai, like all albatross parents, take turns incubating the egg or caring for the chick while the other forages for food at sea.

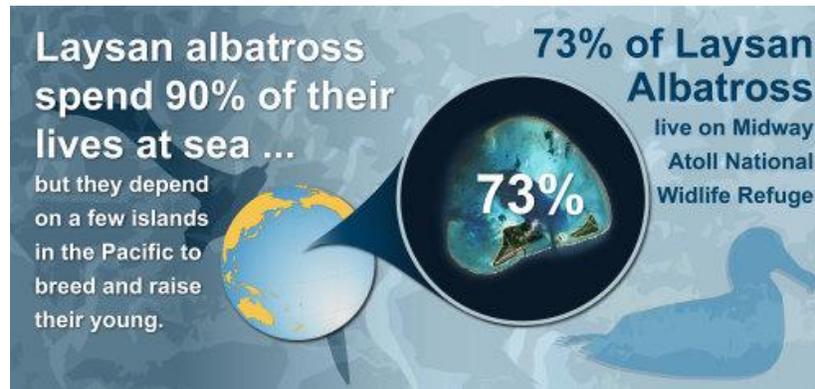
"Midway Atoll's habitat doesn't just contain millions of birds, it contains countless generations and families of albatrosses" said Kelly Goodale, U.S. Fish and Wildlife Service Refuge Biologist. "If you can imagine when Wisdom returns home she is likely surrounded by what were once her chicks and potentially their chicks. What a family reunion!"

Wisdom has successfully raised at least 30-36 albatross chicks over the course of her life. Because Laysan Albatross do not lay eggs every year and raise only one chick at a time when they do, the contribution of one bird to the population makes a huge difference. Wisdom's recent addition has expanded her albatross family and contributes to the continued health of the Laysan Albatross population overall.

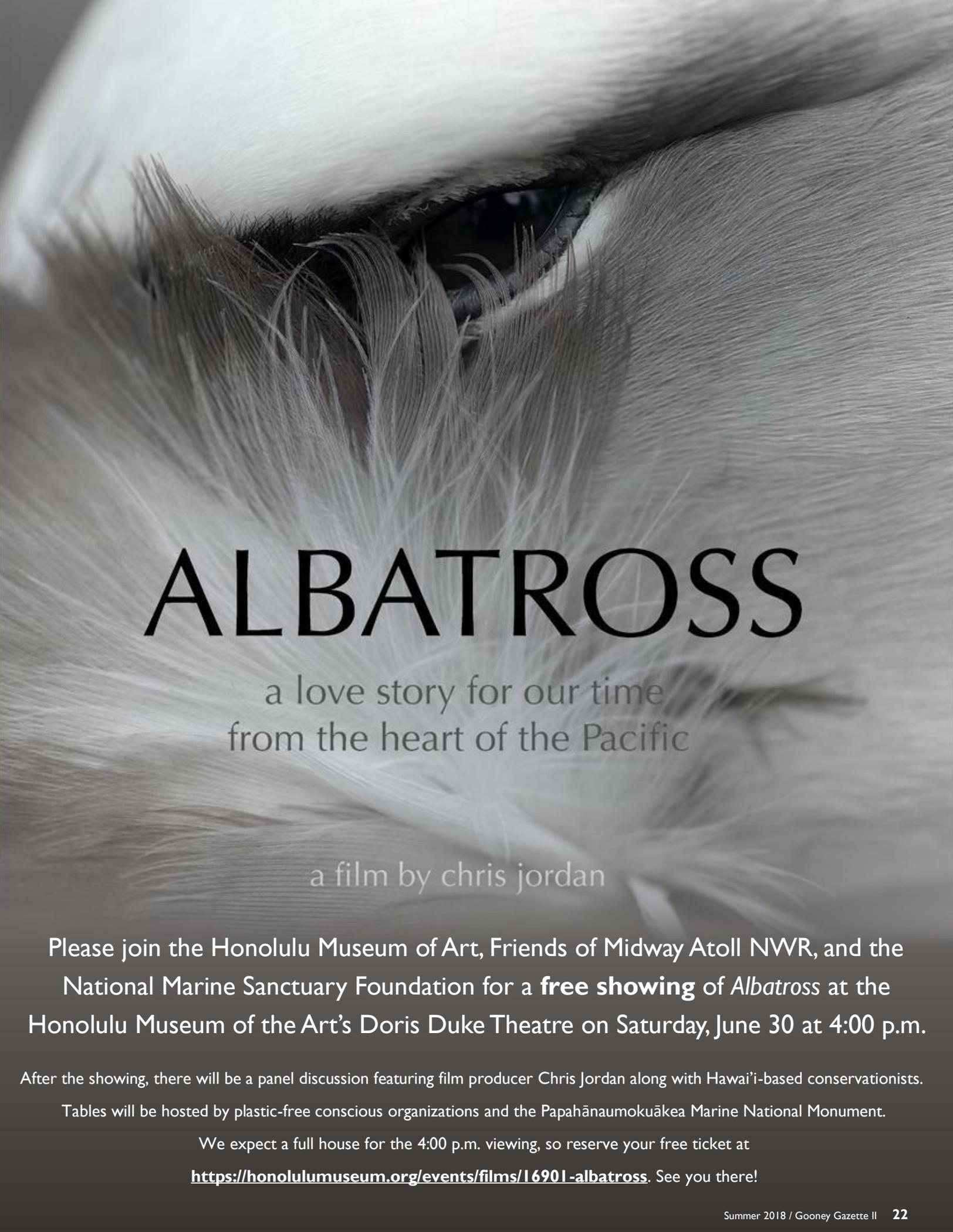
"Albatross invest an enormous amount of resources to raise their chicks" said Peyton. "Albatrosses and other seabirds choose Midway Atoll NWR as their home because it's a safe place. Thanks to the hard work of staff and volunteers, we are restoring the native habitat that the birds need for nesting sites, ensuring a future for these seabirds."

The Refuge and Memorial is home to the largest albatross colony in the world and is the most important and successful breeding colony for Black-

footed Albatross (*Phoebastria nigripes*) and Laysan Albatross (*Phoebastria immutabilis*). Globally significant, Midway Atoll NWR is home to 36% of all Black-footed Albatross and 73% of all Laysan Albatross, as well as the endangered Short-tailed Albatross (*Phoebastria albatrus*). Albatross start to arrive to return from sea to breed in late October and by the end of November nearly every available nesting space on the Midway Atoll NWR is claimed by a breeding pair. For more stories, photos and videos about Midway Atoll NWR visit: goo.gl/qwgcGt.



Photos by USFWS



ALBATROSS

a love story for our time
from the heart of the Pacific

a film by chris jordan

Please join the Honolulu Museum of Art, Friends of Midway Atoll NWR, and the National Marine Sanctuary Foundation for a **free showing** of *Albatross* at the Honolulu Museum of the Art's Doris Duke Theatre on Saturday, June 30 at 4:00 p.m.

After the showing, there will be a panel discussion featuring film producer Chris Jordan along with Hawai'i-based conservationists.

Tables will be hosted by plastic-free conscious organizations and the Papahānaumokuākea Marine National Monument.

We expect a full house for the 4:00 p.m. viewing, so reserve your free ticket at

<https://honoluluuseum.org/events/films/16901-albatross>. See you there!

Get Your Bling ON!

Join the Wisdom "Fan Club"



Photo by Kristina McOmber/Kupu



We know Wisdom's age thanks to the USFWS' meticulous bird banding records. She was first banded in 1956, but it wasn't until 2006 that we really got to know her. That's when a second band was added to her right leg to make it easier to identify her. The band is bright red with the code: Z333.

The WISDOM BAND available here is made of 14-gauge aluminum, chosen specifically because it is not plastic. It's also soft enough to bend to fit your wrist. Each band is hand-stamped with the same band number as Wisdom's: Z333. The bands are 5/8" wide by 6" long that is curled by hand into a bracelet cuff. Each band is hand-made. Imperfections are to be expected.

\$5 from the sale of every WISDOM BAND goes to FOMA in Wisdom's name for albatross conservation work done on her and her fellow albatross' behalf. Order your WISDOM BAND at <https://www.albatographer.com/wearable-art/wisdom-band>.

Meet the Artist

KIM STEUTERMANN ROGERS



"It all started one winter when I flew to Midway Atoll National Wildlife Refuge in the North Pacific to count albatross nests. Maybe it was the sound of their courtship mooing and whinnying outside my window that seeped into my being as I slept. Perhaps it was the ocean scent of their sun-warmed feathers emanating off their big bodies. Since then, I've come to love the majestic albatross, in particular the Laysan albatross. I write about them for national and local magazines. On behalf of the Department of Fish and Wildlife, I monitor a large colony of them on the Hawaiian Island of Kauai where I live. And I photograph them. With their artistic faces, the tender love they express toward their lifelong partners and their chicks, and their outstretched, six-and-a-half-foot wings in flight, they make beautiful portraits.

And, yet, I want to do more for albatross. I want to give back. I've decided the way I can do that is through my photography and wearable art."



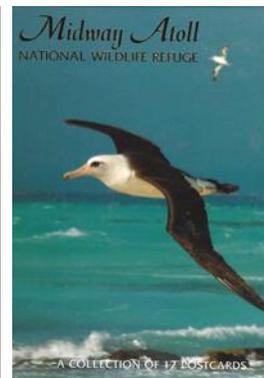
*Even against the greatest of odds,
there is something in the human spirit...
that can lift men from certain defeat
to incredible victory. -Walter Lord*

Friends of Midway Atoll invites
you to the

MIDWAY ONLINE STORE

Your destination for all kinds of
Midway gear!

Check out our online store for a variety of items, such as water bottles, tote bags, t-shirts, posters, and more! Be sure to check back often for new items, such as our new **Battle of Midway t-shirt** (design pictured above).



Proceeds from FOMA merchandise go toward crucial ecological restoration, education and outreach activities, and historical preservation work on Midway. These items were developed in partnership with Hawai'i artist Caren Loebel-Fried, who generously donated the use of her imagery to help support Midway Atoll NWR/Battle of Midway National Memorial. The new Battle of Midway design was created by Katerina Paleckova, one of the talented Albatross Census counters from 2016-2017.

Lend a Hand

Volunteer Opportunities with FOMA and USFWS



Photo by Jonathan Plissner/Island Conservation

BECOME A FOMA VOLUNTEER

FOMA is a volunteer-run non-profit organization. Board Members donate their time and skills to support the Refuge because of their passion for Midway Atoll NWR. The FOMA “office” is located in the hearts and minds of the Board, which means that all donations and grant funds go directly to on-atoll projects or outreach activities about the Refuge. We are always looking for volunteers to help with a variety of tasks.

General FOMA Volunteer Needs

Volunteer activities will be directed by and in concert with board members. Even a few hours of your time can make a difference. Some possible areas for volunteer assistance and specific activities include:

- Research and summarize military history on Midway Atoll
- Create new materials about FOMA for display at the Refuge
- Design and create education or outreach materials to inform students and the public about Refuge resources and challenges
- Research information and find images for our newsletter, website, blog, and social media
- Help to share FOMA's mission and work and build a broader constituent base through assisting with social media platforms, such as Instagram, Twitter, and other communication channels

If you are interested in helping FOMA with any of these tasks, please inquire with us at FriendsMidway@gmail.com. We look forward to hearing from you!

BECOME A USFWS VOLUNTEER OR ADVOCATE

- Check out all the opportunities at: http://www.fws.gov/refuge/Midway_Atoll/. Spend up to 6 months on the atoll as a Refuge Biology Volunteer by helping with seabird monitoring and habitat restoration efforts. Not ready for a 6-month commitment? Apply as an Annual Nesting Albatross counter and spend 3 weeks over the winter time (it's still warm!) to help to count all the albatross across the atoll.
- Not able to volunteer on Midway Atoll NWR? The saying goes that the “pen is mightier than the sword,” so consider advocating for Midway! Talk to your state representatives and senators about supporting the National Wildlife Refuge System (Midway Atoll is one of the +560 National Wildlife Refuges across the nation). With an operations and maintenance backlog of +\$3.5 billion and counting, the Refuge System is vastly underfunded. In fact, more than one third of Refuges across the nation have no onsite staff due to budget cuts. To learn more, visit www.RefugeAssociation.org.
- Find a Refuge near you! The National Wildlife Refuge System is responsible for managing more than 850 million acres of lands and waters, including 5 marine national monuments. There is at least one National Wildlife Refuge in each state and U.S. territory. About 500 Refuges are open to the public and nearly all offer free entry. Visit www.fws.gov/refuges/refugelocatorsmaps/ to find a Refuge near you and discover your place to connect with wildlife or join a Friends group to advocate for your favorite Refuge. ☒

Your membership supports crucial ecological conservation and historic preservation of Midway Atoll NWR's unique resources.

Join or renew today!



Brown Noddies (Anous stolidus); photo by Jonathan Plissner/Island Conservation

Friends of Midway Atoll NWR MEMBERSHIP APPLICATION

Please fill out this application and mail (with check) to:
 Friends of Midway Atoll NWR
 17 Katrina Lane
 San Anselmo, CA 94960

Or visit our website at <http://www.friendsofmidway.org/membership/> and follow the instructions to purchase or renew your membership.

Name _____
 Address _____

 City _____
 State/Province _____
 Zip _____
 Country _____
 Email _____
 Phone _____

Membership Level:

- WWII Veteran.....**Honorary**
- Veteran.....\$20.00
- Student.....\$25.00
- Individual.....\$35.00
- Family.....\$50.00
- Contributor.....\$100.00
- Supporter.....\$250.00 or more
- Life.....\$1,500.00
- Donation.....\$_____

- New Membership
- Membership Renewal
- Donation



*All contributions are tax deductible.
 Please make checks payable to:
 "FOMA" or "Friends of Midway Atoll NWR"*